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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/914,181
Filing Date: December 07, 2001
Appellant(s): ANDRE ET AL.

Robert J. Patch
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 24, 2006 appealing from the Office action mailed November 22, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 9-16.

Claims 1-8 have been canceled.

Claims 17 and 18 have been withdrawn from this appeal and are not subject to review herein as appellant has indicated that the appeal of the FINAL rejection of claims 17 and 18 "will not be pressed".

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

It should be noted that appellant does mention the prior art references in his discussion of the summary of the claimed invention, however these comments have merely been considered arguments and unrelated to the summary of the claimed invention.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: Whether claims 9, 11, 12, and 14 are obvious under 35 USC 103(a) as being unpatentable over E.P. 897,174 in view of E.P. 911,803 and Newsam and optionally further taken with any one of Hom, Whitemore et al or Beggs. Whether claims 10, 13, 15, and 16 are obvious under 35 USC 103(a) over Adee et al in view of Daunt et al, E.P. 911,803 and E.P. 897,174 and optionally further taken with any one of Hom, Whitemore et al or Beggs.

GROUNDS OF REJECTION NOT ON REVIEW

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal because they have not been presented for review in the appellant's brief. The rejection of claim 17 under 35 USC 103(a) as being unpatentable over E.P. 897,174 in view of E.P. 911,803 and Newsam and optionally further taken with any one of Hom, Whitemore et al or Beggs. The rejection of claim 18 under 35 USC 103(a) over Adee et al in view of Daunt et al, E.P. 911,803 and E.P. 897,174 and optionally further taken with any one of Hom, Whitemore et al or Beggs.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

It should be noted that claims 17 and 18 are not subject to this appeal as noted by appellant in the Brief but these claims were listed in the appendix. Claims 17 and 18 should not have been listed as claims in the appendix as they are not subject to the appeal.

(8) Evidence Relied Upon

(A) Listing of Evidence Relied Upon

897,174	Porte (European Patent)	2-1999
911,803	Weizenecker (European Patent)	4-1999
4,504,346	Newsam	3-1985
4,291,079	Hom	9-1981
4,292,356	Whitemore et al	9-1981
4,539,244	Beggs wt al	9-1985
4,612,737	Adee et al	9-1986
4,377,736	Daunt et al	3-1983

(B) Brief Description of Evidence Relied Upon

E.P. '174 (note that U.S. 6,268,038 is the English equivalent to E.P. '174 and for purposes of the Appeal it is considered a translation of E.P. '174) suggested that it was known to form an acoustical panel for an aircraft which included the build up of the layers on a mold. The process included the steps of placement of an acoustical layer on the mold followed by a structural layer, a honeycomb layer and a reflector.

E.P. '803 suggested that it was known at the time the invention was made to provide an exterior layer of structural material disposed over the acoustical layer of material (Figure 2) and identified the prior art as having the acoustical layer exposed on the exterior (Figure 1). The reference stated that arranging the acoustic material within the composite assembly as opposed to on the exterior avoided problems of damaging

of the exterior acoustical layer which might result from mechanics working on the inside of the inlet or foreign objects striking the liner to prevent ingestion of the mesh in the engine, see column 1, lines 28-40.

Newsam suggested that it was known at the time the invention was made to provide an acoustical mesh material from either organic fibers or stainless steel wherein the acoustical mesh material was employed in the manufacture of an acoustical panel.

The references to any one of **Beggs et al**, **Hom**, or **Whitemore et al** each suggested that it was known at the time the invention was made to employ an autoclave to apply heat and pressure to an acoustical panel assembly.

Adee et al suggested that those skilled in the art would have formed a perforated sheet for an acoustical panel by disposing a sheet of composite material on a tooling, curing the composite material to take the shape of the tooling, and piercing the composite material to form perforations therein via sand and/or grit blasting. There is no clear indication that the cured composite material remained upon the same tooling during the formation of perforations therein.

Daunt et al suggested that it was known at the time the invention was made to machine perforations in a composite material while the composite material was retained upon a rotating tooling.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 9, 11, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over E.P. 897,174 in view of E.P. 911,803 and Newsam and optionally further taken with any one of Hom, Whitemore et al or Beggs et al.

E.P. '174 (note that US Patent 6,268,038 is the English language equivalent to E.P. '174 which is from the same patent family and appellant is referred to the same as necessary) taught a process for forming an acoustical panel which included the steps of providing a mold 18, applying a mesh layer of acoustical fabric material to the mold 12, applying reinforcing filamentary material via a winding operation onto the layer of acoustical material (see Figures 6B and 7B and note layers 14, 114, 214, and 314), applying a layer of honeycomb material 22 over the strengthening layer of fibers 14, 114, 214, and 314, and applying a reflector layer upon the honeycomb layer (see layer 24, Figure 7D, 7E). Appellant is additionally referred to Figures 8A-8E for a description of the overall operation for application of the various layers to the mold in the manufacture of the acoustical panel. The reference failed to teach that one skilled in the art would have applied the reinforcement (strengthening) layer of fibers upon the mold prior to the application of the acoustical cloth onto the same in the manufacture of the acoustical panel. The reference additionally failed to teach that the acoustical mesh material applied to the mold would have been formed from mineral or organic fiber.

E.P. '803 taught that it was known to incorporate the strengthening layer of reinforcement either under the acoustical fabric material or over the fabric material

(such that the acoustical fabric material was not left exposed in the finished panel assembly), see column 1, lines 32-40, column 2, lines 36-43, column 1, lines 50-53, for example. It should be noted that the entire assembly was assembled together with adhesive and then the entire assembly was cured with the application of heat and pressure in an oven/vacuum bag. E.P. '803 expressly stated the advantages to not having the acoustic layer exposed on the exterior of the final assembly including the prevention of damage to the acoustical layer which might result in the same being injected by the engine of the airplane. Again, the reference to E.P. '803 failed to teach that one skilled in the art would have understood to employ a mineral of polymer fiber for the microporous cloth but instead chose to employ a stainless steel cloth material.

The reference to Newsam suggested that in the art of manufacturing an acoustical panel, it was known to employ as an alternative to a stainless steel microporous cloth material a microporous material formed from polymeric material. More specifically, applicant is referred to column 2, lines 23-24 where the reference suggested that stainless steel filaments would have been useful for the microporous cloth material employed and column 2, lines 14-17, where the reference suggested that the fabric material employed utilized a polyester filament (organic). Where, as here, two equivalents were known for the same desired function, an express suggestion of the substitution of one for the other is not needed to render such substitution obvious, In re Fout, 213 USPQ 532, In re Siebentritt, 152 USPQ 618. In order to provide better protection for the acoustic fabric, it would have been obvious to one of ordinary skill in the art at the time the invention was made to dispose the reinforcement and

strengthening materials against the mold initially followed by application of the acoustical mesh material in E.P. 897,174 as such would have afforded one the benefits of increased service life for the acoustical panel as suggested by E.P. 911,803 wherein the microporous fabric was formed from organic fibers as an alternative to metal fibers as suggested by Newsam. It should be noted that the heat and pressure applied by E.P. '803 would have been understood to have been performed in an autoclave as such was conventionally employed in the manufacture of fiber reinforced composite attenuation panels and was the commonplace manner in which one applied heat and pressure to assemble the layers together. While the reference to E.P. '174 did not disposed the structural material upon the mold prior to introduction of the acoustical mesh material on the mold, one skilled in the art would have readily understood how to perform the same in a molding operation and additionally would have reasonably expected achievement of success when performing the molding operation with the mesh material disposed on the structural material and the structural material disposed directly upon the mold in the construction of the acoustical panel.

While it is believed that one skilled in the art would have readily discerned that the assembly would have been disposed in an autoclave to apply the appropriate pressure to the assembly during curing of the panel assembly as such was commonplace in the art (and it is taken as conventional in the art of bonding a panel assembly to utilize the same), the reference to any one of Hom, Whitemore et al, or Beggs et al suggested that those skilled in the art at the time the invention was made would have incorporated an autoclave to secure the various layers together. Appellant

is more specifically referred to Hom at column 4, lines 28-44 and column 3, lines 45-51, Whitemore et al at column 3, lines 16-31, or Beggs et al at column 4, lines 10-34 all suggested that in the formation of an acoustical panel one skilled in the art would have incorporated an autoclave to apply the pressure and heated during the same in order to cure the resin in the assembly to make the finished panel. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the techniques of any one of Hom, Whitemore et al, or Beggs et al to provide for the heat and pressure necessary to cure the resin layers in the formation of an acoustical panel wherein the reinforcing material was provided on the exterior of the panel as suggested by E.P. 911,803 in the process of making an acoustical noise attenuation panel as taught by E.P. 897,174 wherein the fibers of the microporous sheet included polymeric fibers as an alternative to steel fibers as taught by Newsam.

Claims 10, 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adee et al in view of Daunt et al, E.P. 911,803 and E.P. 897,174 optionally further taken with any one of Hom, Whitemore et al or Beggs et al.

Adee et al suggested that it was known at the time the invention was made to cure a resin impregnated fiber reinforced material which was in a curved configuration prior to the drilling of holes in the same in the manufacture of a perforated sheet for a sound attenuation panel. The curing of the material prior to the perforation operation is said to be performed in order to ensure that the composite material has a set shape prior to the perforating operation as shaping the material subsequent to the perforation operation was found to be difficult in the art. The reference suggested as depicted in

Figure 5A and as described at column 31-43 that one skilled in the art would have desired to form a curved perforated sheet by curing the composite material in a suitable tooling prior to the perforation operation. The appellant is advised that such tooling would have included a mandrel. The reference subsequent to the curing of the composite material, suggested that a suitable maskant was applied to the curved composite material and the assembly was subjected to the drilling operation via a sand and/or grit blasting operation. The reference failed to teach that the cured part remained upon the tooling (the mandrel) during the perforation operation. It should be noted, however that one skilled in the art would have understood that there was a relative movement required between the part and the nozzle which directed the grit in the formation of the holes in the material, see column 6, lines 8-12. The reference is silent as to what type of tooling would have been utilized during the grit blasting operation to provide the relative movement.

Daunt et al suggested that a composite fiber reinforced material which was in the form of a cylinder would have been provided with perforations therein via a machining operation wherein the sound attenuation member was formed form a fiberglass laminate which included epoxy resin and wherein holes were formed in the same while the cylindrical member was supported on a drum (during hole formation). The reference suggested that a laser operation would have been performed upon the material. During the piercing operation there was relative movement between the cylindrical part and the piercing tool by disposing the part on a cylindrical form or mandrel and rotating the mandrel during the piercing operation. As the reference to Adee et al suggested that the

part would have been cured while disposed upon such tooling, one skilled in the art would have understood that the tooling (the cylindrical mandrel) would have merely been kept in place for the piercing operation. As one skilled in the art would have understood that it was necessary to provide relative movement between the part and the piercing device which was provided by incorporation of a drum or mandrel on the part, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a form or tool onto which one perforated the material wherein such form or tool was desirably the same form or tool which was used during lay up and curing of the material as suggested by Daunt (the use of a tool during the perforation operation which was a cylindrical mandrel) and Adee (who clearly suggested that the material would have been cured prior to the perforation operation on a tool) in the process of making a perforated composite cylindrical member for a noise attenuation panel. The reference to Adee et al suggested that the acoustical panel would have been formed with a microporous layer on the exterior of the assembly and additionally that the structure would have included a cellular structure as well as a reflector assembly therein, see Figure 3. The reference did not state that one skilled in the art would have provided the exterior layer as the structural layer of the panel.

E.P. '803 taught that it was known to incorporate the strengthening layer of reinforcement either under the acoustical fabric material or over the fabric material (such that the acoustical fabric material was not left exposed in the finished panel assembly), see column 1, lines 32-40, column 2, lines 36-43, column 1, lines 50-53, for example. It should be noted that the entire assembly was assembled together with

adhesive and then the entire assembly was cured with the application of heat and pressure in an oven/vacuum bag. The reference to E.P. '803 suggested that those skilled in the art would have employed the embodiment where the microporous material was disposed under the perforated sheet material in order to protect the same as described at column 2, lines 54-column 3, line 6. The combination did not expressly envision the build up of the honeycomb and reflector in the manner claimed in the manufacture of the panel assembly wherein the same was done on a mold.

The reference to E.P. '174 (note that US Patent 6,268,038 is the English language equivalent to E.P. '174 which is from the same patent family and appellant is referred to the same as necessary) taught a process for forming an acoustical panel which included the steps of providing a mold 18, applying a mesh layer of acoustical fabric material to the mold 12, applying reinforcing filamentary material via a winding operation onto the layer of acoustical material (see Figures 6B and 7B and note layers 14, 114, 214, and 314), applying a layer of honeycomb material 22 over the strengthening layer of fibers 14, 114, 214, and 314, and applying a reflector layer upon the honeycomb layer (see layer 24, Figure 7D, 7E). Appellant is additionally referred to Figures 8A-8E for a description of the overall operation for application of the various layers to the mold in the manufacture of the acoustical panel. It would have been obvious to one skilled in the art at the time the invention was made to employ a structural layer on the exterior of the composite panel as suggested by E.P. 911,803 (for the reasons expressed by E.P. '803) wherein one skilled in the art would have understood that the structural panel would have been formed in a perforating process

where a composite sheet material was perforated on a drum as taught by Daunt et al and Adee et al where one built up the layers of the acoustical panel in a mold in accordance with the laminating techniques of E.P. 897,174.

While it is believed that one skilled in the art would have readily discerned that the assembly would have been disposed in an autoclave to apply the appropriate pressure to the assembly during curing of the panel assembly as such was commonplace in the art (and it is taken as conventional in the art of bonding a panel assembly to utilize the same), the reference to any one of Hom, Whitemore et al, or Beggs et al suggested that those skilled in the art at the time the invention was made would have incorporated an autoclave to secure the various layers together. Applicant is more specifically referred to Hom at column 4, lines 28-44 and column 3, lines 45-51, Whitemore et al at column 3, lines 16-31, or Beggs et al at column 4, lines 10-34 all suggested that in the formation of an acoustical panel one skilled in the art would have incorporated an autoclave to apply the pressure and heated during the same in order to cure the resin in the assembly to make the finished panel. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the techniques of any one of Hom, Whitemore et al, or Beggs et al to provide for the heat and pressure necessary to cure the resin layers in the formation of an acoustical panel wherein the reinforcing material was provided on the exterior of the panel as suggested by E.P. 911,803 in the process of making an acoustical noise attenuation panel which was formed with a structural layer formed in a perforating operation as taught by Daunt

et al and Adee et al where the manufacture of the panel additionally included the build up of the components in a mold as suggested by E.P. 897,174.

(10) Response to Argument

The appellant does not address the differences between claims 9 and 10 and expressly states that all claims stand or fall together. As such the specifics of these claims and the references applied other than those specifically addressed by appellant will not be discussed as it is deemed that appellant has acquiesced to the teachings of these references. The appellant does address the reference to E.P. '174 and E.P. '803 in detail and these references will be discussed in more depth below.

The appellant essentially argues that there is no prima facie case which has been established because no single reference suggested the emplacement of a structural layer on a mold first followed by placement of an acoustical layer thereon and the remaining build up of the composite panel thereon. The appellant noted that E.P. '174 suggested that one skilled in the art would have placed the acoustical layer on the mold prior to placement of the structural layer thereon. The appellant also noted that in E.P. '803 the acoustical layer was disposed on the honeycomb layer prior to placement of the structural layer thereon. In E.P. '803 the assembly was then placed in a vacuum bag and the assembly was cured. The appellant therefore concludes that none of the reference taught the placing of a structural layer on a mold in the build up of the acoustical panel as required in claims 9 and 10.

The applicant is advised that the reference to E.P. '174 clearly established an order of build up of the panel which included the steps of placement of a fabric mesh material upon a mold, placement of a fiber reinforced resin impregnated porous structural acoustical component onto the mesh material, placement of a cellular material upon the acoustical component and placement of a reflector component upon the cellular component. It is agreed that the reference did not place the structural layer on the mold initially. While the reference did fail to teach the placement of the resin impregnated filaments of the porous structural component upon the mold prior to the placement of the mesh material thereon, E.P. '803 suggested there were known benefits in the art for placement of the structural porous layer on the exterior of the assembly and to disposed the acoustical mesh directly below the same between the cellular core and the porous structural layer. Such advantages included the elimination of possible break off and damage to the panel as a result of losing portions of the exterior mesh material. The appellant has repeatedly bee referred to column 1, lines 32-40 of the reference to E.P. '803. The reference expressly stated that:

> "Specifically, when mechanics work inside the inlet, or when certain foreign objects strike the liner, the exposed mesh skin is relatively easily susceptible to damage which, of course, must then be repaired to prevent ingestion of mesh structure into the engine."

The reference to E.P. '803 disclosed the prior art embodiment with reference to Figure 1 where the acoustical liner had a mesh exterior (column 2, lines 37-39). The reference to E.P. '803 resolved this problem associated with possible damage to the exterior mesh liner be reversing the order of the structural supporting layer and the mesh liner whereby the structural supporting layer was on the exterior and the mesh liner disposed

adjacent the same but underneath the structural layer as depicted in Figure 2, see column 2, lines 40-42. Appellant is advised that one skilled in the art would have not only understood that placement of the resin impregnated fiber layer on the mold initially followed by placement of the mesh thereon and then the cellular layer and reflector would have been performed as an alternative to placement of the mesh on the mold first (as was performed by E.P. '174) but that the disposing of the structural layer on the exterior had the benefits identified by E.P. '803. The fact that E.P. '803 did not build the assembly in the same manner as claimed is immaterial to whether it would have been obvious to do so in E.P. '174. Appellant does not dispute the benefits defined by E.P. '803 nor does appellant assert that it was unobvious to switch the placement in E.P. '174 for some reason. One viewing the prior art would have been expected to perform the identified operation for the reasons given and would have been expected to have been successful in such an arrangement. The appellant is advised that obviousness is not based upon absolute certainty but rather is based upon whether one skilled in the art would have reasonably expected that the proposed combination would have worked, see In re O 'Farrell, 7 USPQ2d 1673. The appellant is advised that there is every reason to believe that the use of the structural porous exterior layer on the outside rather the just below the acoustic mesh material would have been expected to have performed adequately as expressed by E.P. '803 and there is no reason to believe one would not have obtained an adequate product when such a layer was laid upon the mold initially rather than as the second layer in the building of the panel on a mold surface as suggested by E.P. '174.

The appellant argues that draping winding or wrapping a layer of filaments on a mold as in initial step and the emplacing the acoustical layer thereon would not have been obvious when starting with E.P. '174 since the clear benefit from E.P. '803 is to start the process with the backface sheet as a base and build the composite from the same. The appellant is advised that while the reference to E.P. '803 did in fact start with the backface sheet to build up the composite panel, one viewing the reference would have understood that the advantages of E.P. '803 where the facing material was the structural material rather than the acoustical material would have been achieved whether one built the composite panel starting the facing of the panel of the backsheet of the panel. The appellant is advised that E.P. '803 does not impart any special needs or associate any advantage to starting the manufacture of the panel with the backface of the same. Additionally, one skilled in the art would have readily understood when viewing the prior art as a whole that the artisan was well aware that the composite acoustical panels were manufactured either from the facing sheet as a starting point or the backsheet as the starting point and would have appreciated that there was no recognized advantage to starting from either side in the build up of the composite panel.

The appellant also argues that there is no reason to switch the placement of the layers in E.P. '174 simply because in E.P. '174 the filaments are pressed in the acoustic layer which is supported by the mold and because is does not appear obvious that putting the acoustic layer on filaments already on a mold would be able to reinforce the acoustic layer. The appellant is advised that the motivation to alter the order of lay down was clearly provided by E.P. '803 as discussed above. Additionally, as expressed above

one skilled in the art would have expected to have understood how to lay down the structural filaments initially and follow the same with the lay down of the acoustic mesh material on the mold. The artisan was well aware of build up of the panel from either the facing or the backsheet. Additionally, one would have reasonably expected that this processing would have worked.

The appellant also notes that the reference to E.P. '803 is referring only to cowl panels and that these inlet cowl panels have simple surfaces which are capable of being formed from metal rather than composite materials and that the reference to E.P. '174 expressed that engine air inlets (engine inlet cowls) including the lip of the inlets have a more complex shape which cannot be easily manufactured of metal and thus the references are incompatible. It should be noted that the basic teaching in E.P. '803 (the possible damage of the mesh material when it is the facing material) is applicable whether the panel has a complex shape or not as well as whether the composite panel is formed from metal or composite materials. Additionally the claims at hand do not require a complexly curved shape for example and thus the claims as presented are not commensurate in scope with the argument. Also, note that both E.P. '174 and E.P. '803 are concerned with acoustical panels for engine cowls and thus it would have reasonable been assumed that one skilled in the art would have known how to utilize the relative teachings of one in the other and vice versa.

The appellant lastly asks one to read page 10, lines 1-19 of the specification and queries as to whether the prior art achieves the identified advantages. Appellant is advised that one need not identify the listed advantages to present a prima facie case.

Rather, the fact that appellant chose to alter the order of the lay up of the composite layers in the composite panel for the specified reasons identified does not alter the conclusion that the order of the layers applied to the mold in E.P. '174 would have been reversed in order to achieve the benefit of reduced risk of damage to the acoustic mesh material as identified by E.P. '803, see In re Lintner, 173 USPQ 360, In re Shetty, 195 USPQ 753, In re Hoch, 166 USPQ 406, and In re Wilder, 166 USPQ 545.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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